Economics Department

Employment Reallocation, Wages and the Allocation of Workers Between Expanding and Declining Firms

CHRISTIAN BELZIL

ECO No. 96/17

EUI WORKING PAPERS

EUROPEAN UNIVERSITY INSTITUTE

EUROPEAN UNIVERSITY INSTITUTE, FLORENCE

ECONOMICS DEPARTMENT

EUI Working Paper **ECO** No. 96/17

Employment Reallocation, Wages and the Allocation of Workers Between Expanding and Declining Firms

CHRISTIAN BELZIL

BADIA FIESOLANA, SAN DOMENICO (FI)

Printed in Italy in June 1996
European University Institute
Badia Fiesolana
I – 50016 San Domenico (FI)
Italy

Employment Reallocation, Wages and the Allocation of Workers Between Expanding and Declining Firms

Christian Belzil*
Concordia University, Department of Economics,
1455 de Maisonneuve West, Montreal H3G 1M8,Canada
and
European University Institute,
San Domenico di Fiesole I-50016, Italy

May 28, 1996

Abstract

Using Danish firm level data on employment dynamics merged with individual records on all workers in a given firm, various measures of employment reallocation used in the macroeconomics literature are incorporated in a wage equation framework and the return on human capital investments are estimated using fixed and random effects models. After investigating the effects of net and gross job reallocation on wages, I estimate simultaneous models where firm effects (affecting employment dynamics) and worker unobserved ability (affecting wages) are allowed to be correlated and I inspect the allocation of workers across expanding and declining firms. Finally, I also investigate the distinction between stayers and movers.

*The author would like to thank the Center for Labour Market and Social Research (Aarhus, Denmark) and the European University Institute for their hospitality. Conversations with Francis Kramarz, Paul Bingley and Niels Westergård-Nielsen are gratefully acknowledged. The usual disclaimer applies.

1 Introduction

The dynamic features of labor markets and, more particularly, the flows in and out of unemployment have always offered serious challenges to both macro and micro economists. Micro economists have traditionally focused on the composition of unemployment while macro economists have paid enormous attention to its cyclical behavior. More recently, while both Europe and the United States experienced relatively high rates of unemployment, the "Matching" approach to labor market flows has become increasingly popular among those interested in modeling the cyclical behavior of unemployment-employment and employment-unemployment flows using time series data.[1]

Although data on gross labor market flows are able to capture worker turnover and its behavior over the business cycle, they reveal very little (perhaps nothing) about the causes of mobility. Consequently, the nature of the driving economic forces behind worker turnovers has simultaneously raised enormous interest and led economists to investigate the notion of job (employment) reallocation using plant level data. In a series of papers, Davis and Haltiwanger (1990, 1992) have investigated the cyclical behavior of gross job flows (job creation and destruction) in US manufacturing. They report that both significant job creation and destruction coexist at all phases of the business cycle. In particular, the coexistence of both job creation and destruction within narrowly defined industries points out to the importance of firm heterogeneity. As a consequence, theoretical representation of the labor market where firms are treated as representative agents should therefore be regarded suspiciously. They also report that job destruction (strongly counter-cyclical) is more variable than job creation (more or less acyclical) and that, as a consequence, the driving force behind recessions and expansions is job destruction (not job creation). As similar results have been found for European countries (see Burda and Wyplosz, 1994 for a review), theoretical models compatible with those findings have recently been developed and potential explanations for the asymmetric behavior of job creation and destruction have also been advanced. As a result, the view that recessions play a "cleansing role" (job destruction is clustered in business cycle downturns) has become increasingly popular.[2]

[1] Blanchard and Diamond (1992) use the term "flow approach" to designate a series of papers devoted to the understanding of the dynamics of workers and job flows.

[2] Possible explanantions for the asymmetric behavior of job creation and destruction in-

Despite the increasingly large number of studies concerned with either worker flows or job reallocation, remarkably few studies have tried to analyze both phenomena simultaneously. Anderson and Meyer (1994) is a notable exception. In a study based on four (4) US states, they document that worker turnover can be broken down as follows; 28% of all worker turnover is explained by temporary layoffs, 31% by job reallocation (creation or destruction) and the remaining 42% by permanent job matches creation and destruction at existing jobs/positions. As their data do not incorporate individual characteristics such as age, sex, education or marital status, a micro-econometric analysis of the links between job flows, workers flow and human capital variables is rendered difficult.

In particular, very little is known about the effect of firm employment reallocation on wages and about the allocation of workers across expanding and declining firms. These issues, perhaps ignored because of data availability, appear quite interesting. Although labor economists have recognized for a long time the potential importance of firm characteristics in models of wages and human capital, the absence of data where firm attributes and individual characteristics are merged has prevented them to go beyond including firm size in standard wage equations. The recent development of data containing firm as well as worker information is however likely to remove this oversight.[3]

Introducing firm employment dynamics (job creation/destruction and job reallocation) in a model of wages and human capital might be justified for two main reasons. First, if firms expanding faster than average pay more (in order to attract workers as an example), failure to take into account firms expansion might seriously bias estimates for the return on human capital investment such as education or experience. Secondly, analyzing wages jointly with firm employment reallocation policies might shed light on the nature of firm heterogeneity (pointed out by Davis and Haltiwanger, 1992) and therefore help understand how labor force composition within a firm may affect its expansion rate. These are the two main issues on which I will focus in the current study.

The main findings may be summarized as follows. There is empirical

clude the following. Technological progress, non-convexities in adjustment costs functions explained by fixed firing costs, reallocation is more efficient in periods of low productivity and passive learning about firm's initial condition. Blanchard and Diamond (1990) review several of these explanations.It should however be pointed out that none of these hypotheses has, so far, imposed itself as conclusive. The development of models compatible with simultaneous creation and destruction still represents a challenge for current researchers.

[3]For a recent example with French data, see Abowd, Kramarz and Margolis (1994).

evidence that workers employed in firms either creating jobs or firms reallocating employment (firms with a high level of turnover) tend to receive higher wages given their stock of human capital. When individual effects and firm effects are allowed to be correlated, this relationship is substantially minimized. There is evidence that workers with higher ability tend to work in expanding firms while the allocation of workers between firms reallocating employment is not as clear.

The paper is constructed as follows. In the next section, I state briefly the objectives which I pursue in this study. The third section is devoted to the presentation of the data set used in the study. The econometric specifications are presented in section 4 while results are discussed in section 5. Some potential avenues for research are identified in the concluding section.

2 Objectives

As the literature clearly lacks studies analyzing wages and employment reallocation simultaneously , the development and the estimation of microeconomic models where both worker and firm heterogeneity are taken into account appear a promising avenue for research. This paper constitutes a first step toward the removal of some of these shortcomings. In what follows, I analyze individual longitudinal data on Danish workers along with firm data on employment (size) changes over a period of 12 years. The data set is quite unique and will be presented in section 3. However, one of its distinctive feature is that total cumulated experience (measured as the sum of all employment periods since entering the labor force) is reported and therefore allows me to avoid potential experience measures which are typically used in the literature. As a consequence, I am able to identify age effects from experience effects. Furthermore, as the sample contains a sufficiently large number of individuals who acquire additional education after having entered the labor force, I can also estimate the effects of education in a fixed effects framework.

The main objective is to introduce notions of gross and net job reallocation in a standard human capital framework. To do so, I estimate a standard wage regression equation in conjunction with sample information on firm's job creation and destruction histories using standard panel data methods. Although the data set used in the paper would undoubtedly enable researchers to investigate a very large number of economic issues (some of them will be discussed when I address potential avenues for research), I pay a particular attention to three (3) broad classes of questions;

- The effects on wages of net job creation (or destruction) and gross job reallocation
- The sensitivity of the estimates of the return to human capital to the inclusion of firm employment dynamics variables.
- The endogeneity of firms job creation/destruction and employment reallocation histories with respect to workers wages.

To do so, I specify log hourly wage equations using standard human capital arguments but I incorporate measures of job creation/destruction and job reallocation as they are defined in the recent macroeconomic literature and treat them as time varying regressors. As pointed out in the literature, the notion of employment reallocation is fairly difficult to capture empirically. In the IDA data set, I can measure net job creation/destruction quite accurately. However, measuring actual employment reallocation is much harder, perhaps impossible. In a typical firm, workers move in and move out for different reasons. Some individuals move out as a result of employed search activities while others are displaced by job destruction or simply by match dissolution. The IDA data set does not allow me (just as most data sets) to infer a cause for separation. In order to evaluate the extent of employment reallocation, I measure the sum of all newcomers (those who had no attachment with the current firm in the previous year) and all leavers (those who have no attachment with the firm in the following year) and I treat this variable (indicating the amount of turnover in a given firm for a particular year) as an upper bound for gross employment reallocation. In the final section of the paper, I also consider an average of net job creation and gross employment changes (total turnover) .

3 The IDA Data Set

3.1 Description

The empirical analysis presented in the paper has been carried on the Integrated Data Base for Labor Market Research (IDA) which has been created by Danish Statistics from the entire population of Danish firms. The IDA data set is a longitudinal data base (with annual observations) starting in 1980 and it contains both private and public firms. Total employment for each firm is recorded as of November of each year and industrial classification as well as

regional location are also recorded. It is therefore easy to follow the job creation and destruction pattern for each firm over the 1980-1991 period.

Although the unit of reference in the IDA data set is the firm, it also contains information on each employed individual as of the last week of November. This information is actually obtained by registered data on all Danish labor force participants. The information on individuals includes variables such as age, education, experience, gender, occupation type, marital status, number of children and hourly wage rate. It is therefore possible to follow wages over a twelve (12) year for a given individual. Note that the structure of the data also enables to construct a tenure variable. However, this variable is left censored for those whose employment relationship was initiated before 1980. The IDA data also contain information on unemployment history for each year. A notable feature of the data set used in this study is that every new entrant in a given firm is traced back for one year prior to entrance. Similarly, those individuals leaving a firm are followed for a period of one year. This feature of the data would therefore allow us to study mobility patterns of Danish workers.

3.2 Sampling Method

The study presented in this paper is based on a sample extracted from the IDA data set. This data base incorporates the entire population of firms and workers in Denmark. However, in this study, I only work with a sample extracted from the original database[4]. Initially, 1000 Danish firms have been selected randomly in 1980. Only private sector firms have been sampled. They were selected to be representative of the Danish economy in terms of industry, sector and region. These firms were created either in or before 1980 and they are followed until the end of the sample period (1991). As firms disappear (either for bankruptcy or any other reason), new firms are added to the sample so that the total number of firms, in a given year, always exceeds 1000. Firms either in the agricultural or mining sector have been excluded.

As the main objective of this paper is to investigate the return on human capital in conjunction with firms employment histories, additional restrictions have been added to observations on individuals. I restrict the sample of individual workers, itself extracted from the labor force of each firm sampled, to

[4]The entire IDA population of firms is used to investigate the cyclical behavior of worker and job flows in Albaek and Sørensen (1994) while the sample used in this paper is also used by Bingley and Westergård-Nielsen (1995) in order to investigate individual wage growth within and between establishments.

full-time workers only. As Danish Statistics impute a quality index for each wage reported in registered data, I only analyze individual observations which have the maximum quality (that is the minimum measurement error). It should be noted that none of these conditions imply any restrictions on firms selected or on firm variables. Finally, the measure of experience contained in the IDA data set is less reliable for workers employed prior to 1964. As a consequence, I restrict myself to those individuals who were 16 years old or less (therefore not working in 1964) at that time. This implies that my sample is composed of prime-aged workers who were at most 46 years old by 1991 (the end of the panel). Because the unit of observation is the firm, it is easy to identify workers who stay within a firm over the sample period (stayers) from those who eventually move. In a given year, between 60% and 70% of the sampled individuals remain attached to the same firm. This creates imbalances in the panel and implies that more observations are available on stayers than on movers. however, in order to avoid introducing selection bias, I initially analyze both types of workers present in the sample and postpone the separate analysis of stayers to the end of the paper.

As the original data set is quite large, it is possible to work with distinct sub-samples. This has several advantages. First, it is possible to obtain separate estimates of economic parameters of interest for different groups (or subsamples) and compare those estimates across groups. Second, as fixed-effects techniques (commonly used in panel data analysis) do not allow to estimate the effect of time invariant regressors such as sex, industry or region, the large number of observations allows me to stratify the sample according to these time invariant regressors. As a result, in the present paper, I present empirical evidence from four (4) different samples

- Male skilled workers in manufacturing
- Male unskilled workers in manufacturing
- Male white collar workers in the trade industry
- Female white collars in the trade industry

Overall, these samples represent a wide spectrum of individuals who have potentially very different exposures to business cycles conditions. Sample statistics for each sample is presented in appendix 1.

4 The Econometric Methodology

The econometric estimates presented in this study are based generally on standard wages regression functions. We begin by considering earnings regression equations which are specified according to human capital theory but also incorporate firm characteristics and, in particular, firms job creation/destruction and reallocation histories. Initially, these variables are assumed to be exogenous. Subsequently, I proceed with models where job creation and destruction are allowed to be endogenous[5].

4.1 The Wage Regression Function

The basic wage regression function is represented as follows:

$$Logw_{ijt} = X_{it}\beta + Z_i\alpha + W_j\lambda + S_{jt}\gamma + \Psi_{jt}\left(E_{jt}, E_{jt-1}\right)\theta + \delta_t + \eta_i + \epsilon_{it} \qquad (1)$$

where w_{ijt} denotes the real hourly wage rate of individual i, employed in firm j at time t and E_{js} denotes employment of firm j at time s. X_{it} is a vector of time varying individual specific regressors such as age, experience and education. The vector Z_i contains individual specific regressors which are time invariant (sex, occupation). Firm specific time invariant attributes such as region and industry are contained in W_j while the scalar S_{jt} represents the size of firm j at time t. S_{jt} is computed as follows;

$$S_{jt} = \frac{E_{jt} + E_{jt-1}}{2} \qquad (2)$$

Individual specific effects are represented by the term η_i while δ_t plays the role of a time specific effect. The function Ψ_{jt} represents potential measures of job creation and destruction patterns. In this paper, we consider measures of job creation/destruction similar to those used in the macroeconomic literature. I define job creation, χ_{jt}, as

[5]Given the structure of the IDA data set, it is however impossible to incorporate match specific effects. In order to do so, I would need to observe individuals employed with distinct firms for a relatively long period.

$$\chi_{jt} = \frac{E_{jt} - E_{jt-1}}{S_{jt}} \tag{3}$$

Finally, I also work with a gross job reallocation rate. If we denote the number of new entrants in firm j at time t by N_{jt} and the number of individuals exiting firm j at time t by M_{jt}, then the gross job reallocation rate, ς_{jt}, is given by[6]

$$\varsigma_{jt} = \frac{N_{jt} + M_{jt}}{S_{jt}} \tag{4}$$

Estimation methods for equation (1) vary according to whether or not η is assumed to be fixed (a nuisance parameter) or random. When η is assumed to be fixed, least squares are typically applied to a modified equation (1) where regressors are measured in deviations from mean or, occasionally, in first differences. When individual effects are assumed to be random, generalized least squares techniques are applied to (1). The advantages and disadvantages of each approach are relatively well known to labor economists. Fixed effects techniques imply an important reduction in degrees of freedom when the number of individuals (i in this case) is big. Furthermore, fixed effects techniques do not allow to estimate the effect of time invariant regressors. However, as explained in the previous section, I can solve this problem by sample stratification based on time invariant regressors. Random effect models, which assume that the individual effect is a random variable, require to estimate a much smaller number of parameters and also allow time invariant regressor. However, potential correlation between individual effects and regressors (possible when regressors are endogenous) may constitute a serious drawback. Hausman (1979) has proposed the following specification test based on the observed difference between the random effect estimator (δ_{gls}) and the fixed effect estimator (δ_w);

$$\mathbf{H} = (\delta_{gls} - \delta_w)' \left[Var(\delta_w) - Var(\delta_{gls})\right]^{-1} (\delta_{gls} - \delta_w) \tag{5}$$

As the fixed effects estimator is always consistent, a larger value of **H** provides evidence in favor of the fixed effect estimator.

[6] As χ_{jt} and ς_{jt} represent a lower bound and an upper bound for employment reallocation, I also work with an average of these values and estimate how this average affects wages.

4.2 Simultaneous System

Panel data techniques described earlier allow us to obtain estimates of the regression parameters of interest under the assumption that the regressors are exogenous. As it is often the case in micro-econometrics, the exogeneity assumption might be violated. In this particular example, $\Psi(.)$ might be endogenous if, for instance, workers with high values of η tend to work with firms expanding more than expected. Because better workers would tend to be matched with more dynamic firms, estimates of the effect of job creation and/or job reallocation would be biased. To address this issue, we modify the relation stated in (1) so that the function $\Psi(.)$ is determined from a linear regression model. We assume that log hourly wages are explained by human capital variables and job creation/destruction patterns while firms creation/destruction pattern is explained by firm specific attributes such as region, industry and size. The log wage regression equation and the job creation/destruction equation are therefore given by

$$Logw_{ijt} = X_{it}\beta + Z_i\alpha + \Psi_{jt}\left(E_{jt}, E_{jt-1}\right)\theta + \eta_i + \delta_{wt} + \epsilon_{it} \tag{6}$$

$$\Psi_{jt}\left(E_{jt}, E_{jt-1}\right) = W_{jt}\lambda + S_{jt}\gamma + \delta_{\Psi t} + \varphi_j + \xi_{jt} \tag{7}$$

where δ_{wt} and $\delta_{\Psi t}$ represent the business cycle fixed effect on wages and on employment dynamics respectively. Note that (6) and (7) represent a simultaneous system. The assumption that firm characteristics (W,S) affect employment dynamics and that human capital variables affect wages allows me to obtain identification. Estimation of this simultaneous system is straightforward and can be done using standard instrumental variables techniques. If I assume that η_i and φ_j are nuisance parameters (fixed effects), then a within transformation can be applied to (7) to obtain a predicted value for $\Psi(.)$ which can be used in (6). This is the method used in the paper.

In order to investigate the allocation of workers across firms characterized by different levels of net job creation/destruction and turnovers, I reestimate a version of equations (6) and (7)with an error component structure where I restrict wages to be affected solely by human capital variables, that is

$$Logw_{ijt} = X_{it}\beta + Z_i\alpha + \eta_i + \delta_{wt} + \nu_{it} \tag{8}$$

where

$$\nu_{it} = \eta_i + \varepsilon_{it} \tag{9}$$

and where η_i (the individual effect) is now treated as a normal random variable while ε_{it} is still assumed i.i.d. normal. The employment dynamics equation, for firm j, is given by

$$\Psi_{jt}\left(E_{jt}, E_{jt-1}\right) = W_{jt}\lambda + S_{jt}\gamma + \delta_{\Psi t} + \vartheta_{it} \tag{10}$$

where

$$\vartheta_{it} = \varphi_j + \xi_{jt} \tag{11}$$

φ_j (the firm effect) is also a normal random variable and where ξ_{jt} is i.i.d. normal. Note that (8) and (9) can be estimated by generalized least squares (GLS) and that, for each equation, I can compute a residual. Then, I match each residual ν_{it} with a contemporaneous firm residual , φ_j, and compute a correlation coefficient. A significant correlation would reveal that workers are not randomly allocated across expanding and declining firms.

5 Results

In this section, I discuss the main empirical results. First, I will describe those obtained from model specifications where firm employment dynamics is assumed exogenous while, in the following section, I will discuss models where job creation/destruction and job reallocation are allowed to be endogenous and are instrumented out. Finally, I shall discuss the correlation between individual and firm effects.

5.1 Exogenous Employment Dynamics

The results obtained when employment dynamics variables are assumed to be exogenous are found in table 1A, 1B, 1C and 1D respectively. For each sample, we have three different specifications which differ with respect to the employment dynamics variables included. Furthermore, for each specification I present fixed effects estimates (columns 1,3 and5) and random effect estimates (columns

2,4 and 6). The results obtained for unskilled male workers in manufacturing indicate that age earnings profiles (after controlling for experience and education) are concave. The estimates for the return to experience also indicate concavity (the estimates are robust around 2% per year). The effect of education appears however sensitive to the estimation techniques as fixed effects estimates typically exceed random effect estimates. This is explained by the fact that, in the sample used in this paper, a small number of individuals obtain additional years of education over the sample period. As a consequence, fixed effects estimates of the effect of education are based solely on those individuals. The parameters raising the most interest are however those associated with job creation/destruction (χ_{jt}) and employment reallocation (ς_{jt}). As both of these variables are expressed as a ratio (percentage), the estimated coefficients admit an elasticity representation. Overall, the estimates indicate that workers employed in firms creating jobs (columns 3 and 4) receive higher wages while those working in firms reallocating employment receive lower wages. However, in this case, estimates differ greatly between fixed and random effects (column 5 and 6). When both variables are included (column 1 and 2), both coefficients keep their respective sign and are significant in the fixed effects model while, in the random effects model, the effect of employment reallocation (negative) is not estimated very precisely. Interestingly, coefficients on job creation and gross reallocation have a magnitude comparable to experience or education.

The analysis of the results for skilled workers reveals again that the effect of net job creation is positive while, unlike for unskilled workers, the effect of gross employment reallocation is also positive. The level of significance achieved when both variables are included (column1 and 2 of table 1B) is quite satisfactory since job creation and employment reallocation are expected to be collinear. As expected, the return to experience and education are higher for skilled workers than unskilled worker.

The third sample analyzed is composed of white collar workers in the trade industry and the results are quite comparable to those obtained for skilled workers. Again, I find a positive correlation between wages paid and net job creation and gross employment reallocation. This is particularly true when variables are included separately. Furthermore, similar results are obtained for female white collar workers in the trade industry.

Overall, the preliminary analysis of wages and employment dynamics indicate the following. After controlling for age, experience and education (as well as business cycle conditions), I find that workers employed in firms which are either creating net jobs or in firms more heavily involved in employment reallo-

cation receive higher wages. However, given that estimates are quite sensitive to the estimation technique used and that in all cases the Hausman statistic (denoted H. stat in the tables) tend to reject the null that both estimators are equal, a natural extension is to investigate how much of this relationship can be explained by heterogeneity and endogeneity bias.

TABLE 1A -Estimates for Unskilled Workers in Manufacturing-

(Asymptotic t-ratios in Brackets for parameter estimates and pvalue for Hausman statistic)

	1	3	5
	Fixed. Effects.	Fixed . Effects	Fixed.Effects.
Age	.0209 (1.48)	.0206 (1.47)	.0239 (1.70)
Age^2	-.0002 (0.98)	-.0002 (0.96)	-.0002 (0.85)
Experience	.0193 (1.54)	.0198 (1.78)	.0144 (1.45)
$Experience^2$	-.0007 (1.63)	-.0007 (1.65)	-.0007 (1.65)
Education	.0510 (3.34)	.0507 (3.32)	.0521 (3.42)
χ_{jt} .	.0271 (2.65)	.0198 (1.97)	
ς_{jt}	-.0627 (3.89)		-.0549 (3.45)
S_{jt} .	.0006 (1.96)	.0005 (3.69)	.0011 (3.96)
Hausman test	26.8 (0.01)	32.0 (0.01)	55.5 (0.00)
Sample size	2578	2578	2578

	2	4	6
	Random. Effects	Random Effects	Random Effects
Age	.0235 (2.82)	.0240 (2.89)	.0235 (2.83)
Age^2	-.0003 (2.33)	-.0003 (2.39)	-.0003 (2.24)
Experience	.0192 (3.77)	.0194 (3.81)	.0194 (3.81)
$Experience^2$	-.0005 (1.48)	-.0005 (1.50)	-.0005 (1.52)
Education	.0014 (0.46)	.0013 (0.42)	.0013 (0.43)
χ_{jt} .	.0279 (2.95)	.0264 (2.84)	
ς_{jt}	-.0105 (0.79)		-.0024 (0.19)
S_{jt} .	.0012 (5.81)	.0011 (7.93)	.0014 (6.83)
Hausman test	26.8 (0.01)	32.0 (0.01)	55.5 (0.00)
Sample size	2578	2578	2578

TABLE 1B -Estimates for Skilled Workers in Manufacturing-

(Asymptotic t-ratios in Brackets for parameter estimates and pvalue for Hausman statistic)

	1	3	5
	Fixed Effects	Fixed Effects	Fixed Effects
Age	.0956 (1.29)	.0929 (1.25)	.0433 (1.70)
Age^2	-.0011 (4.29)	-.0011 (4.23)	-.0002 (4.21)
Experience	.0531 (5.70)	.0509 (1.78)	-.0144 (1.04)
$Experience^2$	-.0040 (1.27)	-.0007 (1.30)	-.0007 (1.25)
Education	.1723 (13.5)	.1707 (13.32)	.1724 (3.42)
χ_{jt} .	.0303 (2.17)	.0370 (1.18)	
ς_{jt}	.0336 (1.65)		.0648 (4.45)
S_{jt} .	.0006 (2.75)	.0004 (3.39)	.0005 (4.96)
Hausman test	184.0 (0.00)	32.0 (0.01)	55.5 (0.00)
Sample size	Sample	2622	2622

	2	4	6
	Random Effects	Random Effects	Random Effects
Age	.1181 (9.31)	.1188 (1.38)	.1172 (9.05)
Age^2	-.0017 (8.43)	-.0017 (2.39)	-.0017 (8.34)
Experience	.0323 (4.40)	.0320 (3.81)	.0302 (3.81)
$Experience^2$	-.0022 (4.89)	-.0005 (4.89)	-.0020 (4.33)
Education	.0345 (8.93)	.0344 (8.42)	.0337 (8.67)
χ_{jt} .	.0259 (1.97)	.0357 (2.84)	
ς_{jt}	.0466 (2.61)		.0609 (3.46
S_{jt} .	.0014 (7.61)	.0015 (4.91)	.0014 (6.83)
Hausman test	184.0 (0.00)	32.0 (0.01)	55.5 (0.00)
Sample size	2622	2622	2622

TABLE 1C -Estimates for White Collar Workers in Trade-

(Asymptotic t-ratios in Brackets for parameter estimates and pvalue for Hausman statistic)

	1	3	5
	Fixed Effects	Fixed Effects	Fixed Effects
Age	age .1368 (1.24)	.1435 (1.30)	.1368 (1.24)
Age^2	age^2 -.0011 (3.57)	-.0012 (3.62)	-.0011 (3.57)
Experience	ex .1954 (4.09)	.1912 (4.00)	.1954 (4.09)
$Experience^2$	ex^2 -.0046 (7.87)	-.0046 (7.87)	-.0046 (7.87)
Education	edu .0434 (3.40)	.0457 (3.59)	.0434 (3.40)
χ_{jt} .	χ_{jt} .0229 (1.34)	.0262 (1.54)	.
ς_{jt}	ς_{jt} .0431 (2.34)		.0451 (2.46)
S_{jt} .	S_{jt} .0003 (0.99)	.0002 (0.88)	.0002 (0.56)
Hausman test	44.8 (0.00)	43.6 (0.00)	44.8 (0.00)
Sample size	2385	2385	2385

	2	4	6
	Random Effects	Random Effects.	Random Effects.
Age	.1447 (10.4)	.1456 (10.5)	.1447 (10.4)
Age^2	-.0019 (8.56)	-.0019 (8.61)	-.0019 (8.56)
Experience	.0722 (9.29)	.0717 (9.22)	.0722 (9.29)
$Experience^2$	-.0042 (8.91)	-.0042 (8.94)	-.0042 (8.91)
Education	.0279 (7.39)	.0275 (7.30)	.0279 (7.39)
χ_{jt} .	.0234 (1.50)	.0256 (1.45)	
ς_{jt}	.0341 (2.19)		.0356 (2.89)
S_{jt} .	.0001 (0.56)	.0003 (3.50)	.0003 (3.58)
Hausman test	44.8 (0.00)	43.6 (0.00)	44.8 (0.00)
Sample size	2385	2385	2385

TABLE 1D -Estimates for Female White collars in Trade Industry-

(Asymptotic t-ratios in Brackets for parameter estimates and pvalue for Hausman statistic)

	1	2	3
	Fixed Effects	Fixed Effects	Fixed Effects
Age	.0532 (2.42)	.0522 (2.37)	.0531 (2.42)
Age^2	-.0007 (2.35)	-.0007 (2.39)	-.0007 (2.36)
Experience	.0533 (2.89)	.0537 (2.91)	.0533 (2.89)
$Experience^2$	-.0018 (2.61)	-.0018 (2.53)	-.0018 (2.60)
Education	.1109 (7.82)	.1116 (7.85)	.1108 (7.81)
χ_{jt} .	.0102 (0.58)	.0173 (0.99)	
ς_{jt}	.0522 (2.57)		.0540 (2.70)
S_{jt} .	.0041 (2.19)	.0012 (1.30)	.0027 (2.08)
Hausman test	90.2 (0.00)	84.9 (0.00)	81.9 (0.00)
Sample size	2034	2034	2034

	2	4	6
	Random Ef.	Random Ef.	Random Ef.
Age	.0801 (6.81)	.0802 (6.81)	.0804 (6.82)
Age^2	-.1062 (5.70)	-.0011 (5.70)	-.0011 (5.71)
Experience	.0471 (5.82)	.0463 (5.73)	.0467 (5.76)
$Expereince^2$	-.0020 (3.87)	-.0020 (3.84)	-.0020 (3.83)
Education	.0286 (8.60)	.0283 (8.52)	.0288 (8.61)
χ_{jt} .	.0303 (1.86)	.0333 (2.08)	
ς_{jt}	.0260 (1.63)		.0295 (1.86)
S_{jt} .	.0015 (2.04)	.0040 (1.36)	.0042 (6.21)
Hausman test	90.2 (0.00)	84.9 (0.00)	81.9 (0.00)
Sample size	2034	2034	2034

5.2 Models with Endogenous Employment Dynamics

After having estimated equation (1) under the assumption that the employment process is exogenous with respect to wages, I estimate a simultaneous system such as in (6) and (7). As discussed earlier, if better workers (with higher unobserved ability) tend to work in firms expanding faster than average, the relationship between wages and firm employment dynamics would be an artefact. For this reason, I estimate equation (7) using all exogenous variables in the system (equation 6 and 7) in order to get a predicted value for the firm's employment dynamics variable[7]. I present results for all four samples presented earlier in Table 2A, 2B, 2C and 2D. In this case, only fixed effects estimates are reported. Except for age (a parameter of limited interest here), the estimates for experience and education are relatively robust. This seems true for all four groups considered except perhaps in the case of women in white collar occupations (Table 2D) for whom returns on education are much lower when employment reallocation variables are endogenous. The most striking results are those surrounding employment dynamics variables. For unskilled workers in manufacturing, both net job creation (χ_{jt}) and employment reallocation (ς_{jt}) become totally insignificant when they are included separately or together. Likewise, estimates for male and female white collar workers in the trade industry also reveal no effect of either job creation/destruction or gross employment reallocation. However, for skilled workers (in the manufacturing industry), job creation and employment reallocation are still positive and precisely estimated when each variable is included separately.

As this stage, I can conclude that the empirical relationship between observed wages and firm employment reallocation status is explained by self-selection except for skilled workers in the manufacturing industry. It suggests that workers are not allocated randomly across firms but that individual affecting wages and firm effects affecting employment reallocation are strongly correlated. The most natural step to undertake at this stage is to investigate the correlation between individual effects and firm effects. To do so, I reestimate equation (1) without the $\Psi(.)$ function and equation (2) by generalized least squares (random effect) to obtain an estimate of the individual and firm effects and, thereafter, compute the correlation between both effects. A positive (negative) correlation indicates that workers with higher ability tend to work with firms creating (destroying) jobs. For each sample, I compute a correlation

[7]The results of the first step of the 2sls estimator suggest that both job creation and gross reallocation are strongly countercyclical.

between the wage equation residuals and the firm job creation (χ) residuals as well as the employment reallocation (ς) residuals. The results, presented in Table 3, support the hypothesis of non random allocation of workers. In all four samples, I find either a strong correlation between individual and firm job creation effects or individual and firm gross employment reallocation effects. For unskilled and white collar male workers, there is a positive correlation in both cases. The positive correlation between wages and χ (column1) indicates that, for all groups, workers paid more than expected (given human capital) tend to work with firms creating jobs while for all groups (except for unskilled workers) workers who are paid more than expected tend to work for firms more heavily involved in employment reallocation.

I conclude this section by pointing out that when an average measure of χ_{jt} and ς_{jt} is used as a proxy for employment reallocation level, I obtain results quite similar. These may be found in Appendix 2

TABLE 2A -Estimates from Simultaneous Systems-

Unskilled Workers in manufacturing (Males), Asymptotic t-ratios in Brackets

	1	2	3
	Fixed Effects	Fixed Effects	Fixed Effects
Age	.1300 (1.55)	.1137 (4.26)	.1379 (0.91)
Age^2	-.0002 (0.96)	-.0005 (3.71)	-.0017 (0.93)
Exp	.0237 (1.59)	.0277 (3.70)	.0236 (1.32)
Exp^2	-.0013 (2.33)	-.0009 (2.13)	-.0007 (1.46)
Educ	.0484 (2.81)	.0500 (3.20)	.0521 (3.03)
$\chi_{jt}(pred)$	.1698 (0.40)		-.1092 (0.24)
$\varsigma_{jt}(pred)$		.0437 (0.42)	.0651 (0.38)

TABLE 2B -Estimates from Simultaneous Systems-

Skilled Workers in manufacturing (Males), Asymptotic t-ratios in Brackets

	1	2	3
	Fixed Effects	Fixed Effects	Fixed Effects
Age	.1803 (3.19)	.1276 (1.54)	.0997 (3.83)
Age^2	-.0019 (1.57)	-.0013 (2.69)	-.0012 (2.93)
Exp	.0200 (0.80)	.0017 (0.35)	.0270 (0.15)
Exp^2	-.0008 (0.96)	-.0005 (0.86)	-.0010 (1.60)
Educ	.1678 (8.12)	.1720 (12.23)	.1216 (9.31)
$\chi_{jt}(pred)$	.8022 (1.76)		-.1926 (0.57)
$\varsigma_{jt}(pred)$		.3817 (2.86)	.4401 (2.52)

TABLE 2C -Estimates from Simultaneous Systems-

White Collar Workers in Trade (Males), Asymptotic t-ratios in Brackets

	1	2	3
	Fixed Effects	Fixed Effects	Fixed Effects
age	.1402 (1.25)	.1514 (1.30)	-.0053 (0.38)
age^2	-.0012 (3.58)	-.0013 (1.97)	-.0011(2.54)
Exp	.1979 (3.62)	.1882 (1.84)	.1893 (2.59)
Exp^2	-.0052 (6.43)	-.0050 (4.36)	-.0047 (7.07)
Educ	.0421 (1.50)	.0634 (2.36)	.0034 (0.24)
$\chi_{jt}(pred)$	-.0548 (0.26)		-.1311 (0.16)
$\varsigma_{jt}(pred)$		-.0586 (0.26)	.0874 (0.12)

TABLE 2D -Estimates from Simultaneous Systems-

White Collar Workers in manufacturing (Females), Asymptotic t-ratios in Brackets

	1	2	3
	Fixed Effects	Fixed Effects	Fixed Effects
age	.1043 (8.02)	.0974 (7.49)	.0960 (7.36)
age^2	-.0015 (4.84)	-.0018 (4.66)	-.0018 (4.06)
Exp	-.0487 (4.71)	.0560 (5.38)	.0543 (1.85)
Exp^2	-.0016 (1.64)	-.0011 (0.94)	-.0006 (0.29)
Educ	.0581 (5.13)	.0581 (4.91)	.0583 (4.29)
χ_{jt}	.0812 (0.59)		-.0946 (0.30)
ςjt		-.2082 (0.57)	-.4515 (0.62)

TABLE 3

Correlation between individual effects (Wage) and Firm Effects in (Random Effect)

(T-ratios in Parantheses)

Sample	Wages/χ_{jt}	Wages/ς_{jt}
Unskilled Workers in Manufacturing (males)	.0598 (3.65)	-.1370 (11.41)
Skilled Workers in Manufacturing (males)	.0207 (0.98)	.1000 (5.11)
Whilte Collar Workers in Trade (males)	.0459 (1.87)	.0855 (4.95)
White Collar Workers in Trade (Females)	-.0037 (0.11)	.2407 (15.64)

5.3 Estimates for Stayers

As I argued earlier, a separate analysis of job stayers appears interesting for several reasons. First, it would normally be expected that estimates of employment dynamics effects obtained from a sample of stayers would be more precise as stayers are observed for longer periods in the sampled firm. Secondly, job movers might have different observed as well as unobserved characteristics from stayers and therefore substantially affect the estimates of employment dynamics effects. For this reason, I have done a separate analysis of stayers. In order to obtain sufficiently large number of observations, I had to sample workers across different industries. I however kept the sample stratification by sex and occupation. The results obtained when employment dynamics are exogenous are found in Table 4A and 4B (to save space I only report estimates for skilled and unskilled male workers). Table 5A and 5B are devoted to the models where employment dynamics is instrumented out.

Overall, the picture of the effects of employment dynamics on wages for stayers is not convincingly different from the one obtained for the entire sample.

TABLE 4A -Sample of Unskilled Male Workers (Stayers)-
Exogenous Employment Dynamics (Asymptotic t-ratios in Brackets)

	1	2	3	4	5	6
	Fixed Ef.	Random Ef.	Fixed Ef.	Random Ef.	Fixed Ef.	Random Ef.
χ_{jt}	.0046	.0044			.0074	.0065
	(0.32)	(0.33)			(0.51)	(0.88)
ς_{jt}			-.0527	-.0216	-.0516	-.0223
			(2.75)	(1.34)	(2.70)	(1.38)
H						52.5 (0.00)
Sample	2129	2129	2129	2129	2129	2129

TABLE 4B -Sample of Skilled Male Workers (Stayers)-
Exogenous Employment Dynamics (Asymptotic t-ratios in Brackets)

	1	2	3	4	5	6
	Fixed Ef.	Random Ef.	Fixed Ef.	Random Ef.	Fixed Ef.	Random Ef.
χ_{jt}	.0422	.0404			.0412	.0403
	(2.95)	(3.02)			(2.91)	(2.99)
ς_{jt}			.0330	.0402	.0341	.0421
			(1.73)	(2.45)	(1.79)	(2.55)
H						234.2 (0.00)
Sample	2876	2876	2876	2876	2876	2876

TABLE 5A -Sample of Unskilled Male Workers (Stayers)-

Endogenous Employment Dynamics (Asymptotic t-ratios in brackets)

	1	2	3	4	5	6
	Fixed Ef.	Ran. Ef.	Fixed Ef.	Ran. Ef.	Fixed Ef.	Ran. Ef.
$\chi_{jt}(pred)$	.0290				.0183	
	(0.93)				(0.08)	
$\varsigma_{jt}(pred)$			.0928		-.0259	
			(0.57)		(0.20)	
Corr (w,χ)		.0137				
		(0.59)				
Corr (w,ς)				.0296		
				(1.98)		
Sample	2129	2129	2129	2129	2129	2129

TABLE 5B -Sample of Skilled Male Workers (Stayers)-

Endogenous Employment Dynamics (Asymptotic t-ratios in brackets)

	1	2	3	4	5	6
	Fixed Ef.	Ran. Ef.	Fixed Ef.	Ran. Ef.	Fixed Ef.	Ran. Ef.
$\chi_{jt}(pred)$	-.9275				-.6095	
	(0.70)				(1.58)	
$\varsigma_{jt}(pred)$			.6698		.2600	
			(1.06)		(0.43)	
Corr (w,χ)		.0320				
		(1.32)				
Corr (w,ς)				.0575		
				(2.67)		
Sample	2876	2876	2876	2876	2876	2876

6 Conclusion

Using panel data techniques, I have investigated the empirical relationship between wages and various measures of employment reallocation used in a newly emerging macroeconomics literature. I found a positive correlation between wages paid and either net job creation or gross employment reallocation. However, estimates from simultaneous panel systems reveal that this relationship is actually a composition effect; that is workers with high level of ability (receiving more than expected given age, experience and education) tend to work in firms that have higher employment reallocation rate and higher job creation rate. This result points out the importance of labor force composition (within a given firm) in explaining firm heterogeneity as measured by an idiosyncratic growth rate. Among other things, it implies that firms with higher level of workers turnovers and higher job creation rates might have hiring policies aimed at hiring better workers and might therefore search for new employees in restricted segments of the labor market. For instance, if more dynamic firms recruit only employed workers (as opposed to those unemployed), this might explain why empirical labor economists typically find that employed job search is more effective than unemployed search (see Belzil 1996). An interesting avenue for future research is to link firm heterogeneity and search methods efficiency over the business cycle.

7 References

Abowd, John, Kramarz, Francis and Margolies, David (1994) "High-Wage Workers and High-Wage Firms", INSEE Working Paper.

Albaek, Karsten and Sørensen, Bent (1994) "Worker Flows and Job Flows in Danish Manufacturing", Working paper, University of Copenhagen.

Anderson, Patricia and Meyer, Bruce (1994) "The Extent and Consequence of Job Turnover", *Brookings Paper (Microeconomics)*, pp. 177-248.

Belzil, Christian (1996) "Relative Efficiencies and Comparative Advantages in Job Search" Journal of Labor Economics (January).

Bingley, Paul and Westergård-Nielsen, Niels (1995) "Individual Wages Within and Between Establishments" Working Paper, CLS, University of Århus.

Blanchard, Olivier Jean and Diamond, Peter (1990) "The Cyclical Behavior of the Gross Flows of US Workers", *Brookings Papers on Economic Activity* 2, 85-155.

Blanchard, Olivier Jean and Diamond, Peter (1992) "The Flow Approach to Labor Markets", *American Economic Review: Papers and Proceedings* 82, 354-359.

Burda, Michael. and Wyplosz, Charles (1994) "Gross Worker and Job Flows in Europe", *European economic Review* 38, 1287-1315.

Burgess, Simon (1993) "Matching and Unemployment Dynamics in a Model of Competition between Employed and Unemployed Job Searchers", London School of Economics, Discussion paper no. 70.

Davis, Steve and Haltiwanger, John (1990) '"Job Creation and Destruction: Microeconomic Evidence and Macroeconomic implications", *NBER Macroeconomics Annual V*, 123-168.

Davis, Steve and Haltiwanger, John (1992) "Gross Job Creation, Gross Job Destruction and Employment Reallocation", *Quarterly Journal of Economics* 107, 819-863.

Mortensen Dale and Pissarides Christopher (1994) "Job Creation and Destruction in the Theory of Unemployment", *Review of Economic Studies* 61, 397-415.

Pissarides Christopher (1994) "Search Unemployment with On-the-Job Search", *Review of Economic Studies* 61, 457-475.

APPENDIX 1

Sample Statistics (averaged over years)

	Unsk./Man. (M)	Sk./Man. (M)	W. C./Trade (M)	W. C./Trade (F)
Hourly Wage (per hour)	100 Kr	110 Kr	66 Kr	81.5 Kr
Experience	6.35	7.67	6.97 years	5.95
Age	28.9 years	29.4	28.2 years	27.9
Education	8.97 years	11.29	11.7 years	11.30
% Stayers	36%	49%	65%	63%
χ	6%	6%	1.9%	1.8%
ς	55%	47%	48%	54.9%

Comments

Real Wages: Hourly wages measured in Danish Kroner per hour. Wages are measured in November of each year.

χ : averaged over all years during which the individual is employed with a given firm. Total employment in each firm is computed from the number of primary job holders in November of each year.

ς : averaged over all years during which the individual is employed with a given firm. Gross employment reallocation is defined as the number of newcomers plus number of leavers divided by firm size.

% Stayers: fraction of all workers (in a given year) who were employed with same firm as the preceding year averaged over year.

APPENDIX 2

Parameter Estimates for Average of Job Creation and Gross Employment Reallocation

Unskilled Workers in Manufacturing (Males) in Column 1 and 2

Skilled Workers in Manufacturing (Males) in Column 3 and 4

	1	2	3	4
	F.E.	R.E.	F.E.	R.E.
$(\chi+\varsigma)/2$	-.0017	.0257	.0693	.0669
	(0.11)	(1.85)	(3.56)	(3.73)
$(\chi+\varsigma)/2_{pred}$	.0719		.5173	
	(0.43)		(4.32)	
Corr (w,$(\chi+\varsigma)/2$		-.0952		.1034
		(5.04)		(4.12)
H stat		36.2 (0.00)		159.0 (0.00)

EUI WORKING PAPERS

EUI Working Papers are published and distributed by the
European University Institute, Florence

Copies can be obtained free of charge
– depending on the availability of stocks – from:

The Publications Officer
European University Institute
Badia Fiesolana
I-50016 San Domenico di Fiesole (FI)
Italy

Please use order form overleaf

Publications of the European University Institute

To

The Publications Officer
European University Institute
Badia Fiesolana
I-50016 San Domenico di Fiesole (FI) – Italy
Telefax No: +39/55/4685 636
E-mail: publish@datacomm.iue.it

From

Name .....
Address.....
.....
.....
.....
.....

❒ Please send me a complete list of EUI Working Papers
❒ Please send me a complete list of EUI book publications
❒ Please send me the EUI brochure Academic Year 1996/97

Please send me the following EUI Working Paper(s):

No, Author .....
Title: .....
No, Author .....
Title: .....
No, Author .....
Title: .....
No, Author .....
Title: .....

Date .....

Signature .....

Working Papers of the Department of Economics
Published since 1994

ECO No. 94/1
Robert WALDMANN
Cooperatives With Privately Optimal Price Indexed Debt Increase Membership When Demand Increases

ECO No. 94/2
Tilman EHRBECK/Robert WALDMANN
Can Forecasters' Motives Explain Rejection of the Rational Expectations Hypothesis?

ECO No. 94/3
Alessandra PELLONI
Public Policy in a Two Sector Model of Endogenous Growth *

ECO No. 94/4
David F. HENDRY
On the Interactions of Unit Roots and Exogeneity

ECO No. 94/5
Bernadette GOVAERTS/David F. HENDRY/Jean-François RICHARD
Encompassing in Stationary Linear Dynamic Models

ECO No. 94/6
Luigi ERMINI/Dongkoo CHANG
Testing the Joint Hypothesis of Rationality and Neutrality under Seasonal Cointegration: The Case of Korea

ECO No. 94/7
Gabriele FIORENTINI/Agustín MARAVALL
Unobserved Components in ARCH Models: An Application to Seasonal Adjustment

ECO No. 94/8
Niels HALDRUP/Mark SALMON
Polynomially Cointegrated Systems and their Representations: A Synthesis

ECO No. 94/9
Mariusz TAMBORSKI
Currency Option Pricing with Stochastic Interest Rates and Transaction Costs: A Theoretical Model

ECO No. 94/10
Mariusz TAMBORSKI
Are Standard Deviations Implied in Currency Option Prices Good Predictors of Future Exchange Rate Volatility?

ECO No. 94/11
John MICKLEWRIGHT/Gyula NAGY
How Does the Hungarian Unemployment Insurance System Really Work? *

ECO No. 94/12
Frank CRITCHLEY/Paul MARRIOTT/Mark SALMON
An Elementary Account of Amari's Expected Geometry

ECO No. 94/13
Domenico Junior MARCHETTI
Procyclical Productivity, Externalities and Labor Hoarding: A Reexamination of Evidence from U.S. Manufacturing

ECO No. 94/14
Giovanni NERO
A Structural Model of Intra-European Airline Competition

ECO No. 94/15
Stephen MARTIN
Oligopoly Limit Pricing: Strategic Substitutes, Strategic Complements

ECO No. 94/16
Ed HOPKINS
Learning and Evolution in a Heterogeneous Population

ECO No. 94/17
Berthold HERRENDORF
Seigniorage, Optimal Taxation, and Time Consistency: A Review

ECO No. 94/18
Frederic PALOMINO
Noise Trading in Small Markets *

ECO No. 94/19
Alexander SCHRADER
Vertical Foreclosure, Tax Spinning and Oil Taxation in Oligopoly

*out of print

ECO No. 94/20
Andrzej BANIAK/Louis PHLIPS
La Pléiade and Exchange Rate Pass-Through

ECO No. 94/21
Mark SALMON
Bounded Rationality and Learning; Procedural Learning

ECO No. 94/22
Isabelle MARET
Heterogeneity and Dynamics of Temporary Equilibria: Short-Run Versus Long-Run Stability

ECO No. 94/23
Nikolaos GEORGANTZIS
Short-Run and Long-Run Cournot Equilibria in Multiproduct Industries

ECO No. 94/24
Alexander SCHRADER
Vertical Mergers and Market Foreclosure: Comment

ECO No. 94/25
Jeroen HINLOOPEN
Subsidising Cooperative and Non-Cooperative R&D in Duopoly with Spillovers

ECO No. 94/26
Debora DI GIOACCHINO
The Evolution of Cooperation: Robustness to Mistakes and Mutation

ECO No. 94/27
Kristina KOSTIAL
The Role of the Signal-Noise Ratio in Cointegrated Systems

ECO No. 94/28
Agustín MARAVALL/Víctor GÓMEZ
Program SEATS "Signal Extraction in ARIMA Time Series" - Instructions for the User

ECO No. 94/29
Luigi ERMINI
A Discrete-Time Consumption-CAP Model under Durability of Goods, Habit Formation and Temporal Aggregation

ECO No. 94/30
Debora DI GIOACCHINO
Learning to Drink Beer by Mistake

ECO No. 94/31
Víctor GÓMEZ/Agustín MARAVALL
Program TRAMO "Time Series Regression with ARIMA Noise, Missing Observations, and Outliers" - Instructions for the User

ECO No. 94/32
Ákos VALENTINYI
How Financial Development and Inflation may Affect Growth

ECO No. 94/33
Stephen MARTIN
European Community Food Processing Industries

ECO No. 94/34
Agustín MARAVALL/Christophe PLANAS
Estimation Error and the Specification of Unobserved Component Models

ECO No. 94/35
Robbin HERRING
The "Divergent Beliefs" Hypothesis and the "Contract Zone" in Final Offer Arbitration

ECO No. 94/36
Robbin HERRING
Hiring Quality Labour

ECO No. 94/37
Angel J. UBIDE
Is there Consumption Risk Sharing in the EEC?

ECO No. 94/38
Berthold HERRENDORF
Credible Purchases of Credibility Through Exchange Rate Pegging: An Optimal Taxation Framework

ECO No. 94/39
Enrique ALBEROLA ILA
How Long Can a Honeymoon Last? Institutional and Fundamental Beliefs in the Collapse of a Target Zone

ECO No. 94/40
Robert WALDMANN
Inequality, Economic Growth and the Debt Crisis

*out of print

ECO No. 94/41
John MICKLEWRIGHT/
Gyula NAGY
Flows to and from Insured
Unemployment in Hungary

ECO No. 94/42
Barbara BOEHNLEIN
The Soda-ash Market in Europe:
Collusive and Competitive Equilibria
With and Without Foreign Entry

ECO No. 94/43
Hans-Theo NORMANN
Stackelberg Warfare as an Equilibrium
Choice in a Game with Reputation Effects

ECO No. 94/44
Giorgio CALZOLARI/Gabriele
FIORENTINI
Conditional Heteroskedasticity in
Nonlinear Simultaneous Equations

ECO No. 94/45
Frank CRITCHLEY/Paul MARRIOTT/
Mark SALMON
On the Differential Geometry of the Wald
Test with Nonlinear Restrictions

ECO No. 94/46
Renzo G. AVESANI/Giampiero M.
GALLO/Mark SALMON
On the Evolution of Credibility and
Flexible Exchange Rate Target Zones *

***

ECO No. 95/1
Paul PEZANIS-CHRISTOU
Experimental Results in Asymmetric
Auctions - The 'Low-Ball' Effect

ECO No. 95/2
Jeroen HINLOOPEN/Rien
WAGENVOORT
Robust Estimation: An Example

ECO No. 95/3
Giampiero M. GALLO/Barbara PACINI
Risk-related Asymmetries in Foreign
Exchange Markets

ECO No. 95/4
Santanu ROY/Rien WAGENVOORT
Risk Preference and Indirect Utility in
Portfolio Choice Problems

ECO No. 95/5
Giovanni NERO
Third Package and Noncooperative
Collusion in the European Airline
Industry *

ECO No. 95/6
Renzo G. AVESANI/Giampiero M.
GALLO/Mark SALMON
On the Nature of Commitment in Flexible
Target Zones and the Measurement of
Credibility: The 1993 ERM Crisis *

ECO No. 95/7
John MICKLEWRIGHT/Gyula NAGY
Unemployment Insurance and Incentives
in Hungary

ECO No. 95/8
Kristina KOSTIAL
The Fully Modified OLS Estimator as a
System Estimator: A Monte-Carlo
Analysis

ECO No. 95/9
Günther REHME
Redistribution, Wealth Tax Competition
and Capital Flight in Growing
Economies

ECO No. 95/10
Grayham E. MIZON
Progressive Modelling of
Macroeconomic Time Series: The LSE
Methodology *

ECO No. 95/11
Pierre CAHUC/Hubert KEMPF
Alternative Time Patterns of Decisions
and Dynamic Strategic Interactions

ECO No. 95/12
Tito BOERI
Is Job Turnover Countercyclical?

ECO No. 95/13
Luisa ZANFORLIN
Growth Effects from Trade and
Technology

ECO No. 95/14
Miguel JIMÉNEZ/Domenico
MARCHETTI, jr.
Thick-Market Externalities in U.S.
Manufacturing: A Dynamic Study with
Panel Data

*out of print

ECO No. 95/15
Berthold HERRENDORF
Exchange Rate Pegging, Transparency, and Imports of Credibility

ECO No. 95/16
Günther REHME
Redistribution, Income cum Investment Subsidy Tax Competition and Capital Flight in Growing Economies

ECO No. 95/17
Tito BOERI/Stefano SCARPETTA
Regional Dimensions of Unemployment in Central and Eastern Europe and Social Barriers to Restructuring

ECO No. 95/18
Bernhard WINKLER
Reputation for EMU - An Economic Defence of the Maastricht Criteria

ECO No. 95/19
Ed HOPKINS
Learning, Matching and Aggregation

ECO No. 95/20
Dorte VERNER
Can the Variables in an Extended Solow Model be Treated as Exogenous? Learning from International Comparisons Across Decades

ECO No. 95/21
Enrique ALBEROLA-ILA
Optimal Exchange Rate Targets and Macroeconomic Stabilization

ECO No. 95/22
Robert WALDMANN
Predicting the Signs of Forecast Errors *

ECO No. 95/23
Robert WALDMANN
The Infant Mortality Rate is Higher where the Rich are Richer

ECO No. 95/24
Michael J. ARTIS/Zenon G. KONTOLEMIS/Denise R. OSBORN
Classical Business Cycles for G7 and European Countries

ECO No. 95/25
Jeroen HINLOOPEN/Charles VAN MARREWIJK
On the Limits and Possibilities of the Principle of Minimum Differentiation

ECO No. 95/26
Jeroen HINLOOPEN
Cooperative R&D Versus R&D-Subsidies: Cournot and Bertrand Duopolies

ECO No. 95/27
Giampiero M. GALLO/Hubert KEMPF
Cointegration, Codependence and Economic Fluctuations

ECO No. 95/28
Anna PETTINI/Stefano NARDELLI
Progressive Taxation, Quality, and Redistribution in Kind

ECO No. 95/29
Ákos VALENTINYI
Rules of Thumb and Local Interaction *

ECO No. 95/30
Robert WALDMANN
Democracy, Demography and Growth

ECO No. 95/31
Alessandra PELLONI
Nominal Rigidities and Increasing Returns

ECO No. 95/32
Alessandra PELLONI/Robert WALDMANN
Indeterminacy and Welfare Increasing Taxes in a Growth Model with Elastic Labour Supply

ECO No. 95/33
Jeroen HINLOOPEN/Stephen MARTIN
Comment on Estimation and Interpretation of Empirical Studies in Industrial Economics

ECO No. 95/34
M.J. ARTIS/W. ZHANG
International Business Cycles and the ERM: Is there a European Business Cycle?

ECO No. 95/35
Louis PHLIPS
On the Detection of Collusion and Predation

ECO No. 95/36
Paolo GUARDA/Mark SALMON
On the Detection of Nonlinearity in Foreign Exchange Data

*out of print

ECO No. 95/37
Chiara MONFARDINI
Simulation-Based Encompassing for Non-Nested Models: A Monte Carlo Study of Alternative Simulated Cox Test Statistics

ECO No. 95/38
Tito BOERI
On the Job Search and Unemployment Duration

ECO No. 95/39
Massimiliano MARCELLINO
Temporal Aggregation of a VARIMAX Process

ECO No. 95/40
Massimiliano MARCELLINO
Some Consequences of Temporal Aggregation of a VARIMA Process

ECO No. 95/41
Giovanni NERO
Spatial Multiproduct Duopoly Pricing

ECO No. 95/42
Giovanni NERO
Spatial Multiproduct Pricing: Empirical Evidence on Intra-European Duopoly Airline Markets

ECO No. 95/43
Robert WALDMANN
Rational Stubbornness?

ECO No. 95/44
Tilman EHRBECK/Robert WALDMANN
Is Honesty Always the Best Policy?

ECO No. 95/45
Giampiero M. GALLO/Barbara PACINI
Time-varying/Sign-switching Risk Perception on Foreign Exchange Markets

ECO No. 95/46
Víctor GÓMEZ/Agustín MARAVALL
Programs TRAMO and SEATS
Update: December 1995

***

ECO No. 96/1
Ana Rute CARDOSO
Earnings Inequality in Portugal: High and Rising?

ECO No. 96/2
Ana Rute CARDOSO
Workers or Employers: Who is Shaping Wage Inequality?

ECO No. 96/3
David F. HENDRY/Grayham E. MIZON
The Influence of A.W.H. Phillips on Econometrics

ECO No. 96/4
Andrzej BANIAK
The Multimarket Labour-Managed Firm and the Effects of Devaluation

ECO No. 96/5
Luca ANDERLINI/Hamid SABOURIAN
The Evolution of Algorithmic Learning: A Global Stability Result

ECO No. 96/6
James DOW
Arbitrage, Hedging, and Financial Innovation

ECO No. 96/7
Marion KOHLER
Coalitions in International Monetary Policy Games

ECO No. 96/8
John MICKLEWRIGHT/ Gyula NAGY
A Follow-Up Survey of Unemployment Insurance Exhausters in Hungary

ECO No. 96/9
Alastair McAULEY/John MICKLEWRIGHT/Aline COUDOUEL
Transfers and Exchange Between Households in Central Asia

ECO No. 96/10
Christian BELZIL/Xuelin ZHANG
Young Children and the Search Costs of Unemployed Females

ECO No. 96/11
Christian BELZIL
Contiguous Duration Dependence and Nonstationarity in Job Search: Some Reduced-Form Estimates

*out of print

ECO No. 96/12
Ramon MARIMON
Learning from Learning in Economics

ECO No. 96/13
Luisa ZANFORLIN
Technological Diffusion, Learning and Economic Performance: An Empirical Investigation on an Extended Set of Countries

ECO No. 96/14
Humberto LÓPEZ/Eva ORTEGA/Angel UBIDE
Explaining the Dynamics of Spanish Unemployment

ECO No. 96/15
Spyros VASSILAKIS
Accelerating New Product Development by Overcoming Complexity Constraints

ECO No. 96/16
Andrew LEWIS
On Technological Differences in Oligopolistic Industries

ECO No. 96/17
Christian BELZIL
Employment Reallocation, Wages and the Allocation of Workers Between Expanding and Declining Firms

*out of print